Owner's Manual



Gremlin®/SEGA

space firebird™

MANUAL PART NO.
420-0533

space firebird™

Operating Instructions and Service Manual

MANUFACTURED BY

Gremlin®/SEGA®

TLX 910-335-1621

SPACE FIREBIRD OWNER'S MANUAL

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introduction

This is an electronic game that makes extensive use of digital integrated circuitry and television monitor circuitry. This manual assumes the maintenance technician possesses a general knowledge of solid state circuitry, microprocessor, TTL digital,integrated circuitry and T.V. monitor concepts. Any individual **not** knowledgeable in these areas **should not** attempt repair of the electronic portion of the game. **It should be noted that any attempt to repair the game in the field without the express consent of the factory will immediately void the warranty!!**

important notes

An important service note is posted in this game and is repeated here for emphasis:

If at any time the T.V. screen shows a meaningless display or the game otherwise malfunctions, simply drop a coin into the coin mechanism. This should correct the problem. If not, the game requires service.

The circuitry in this game has been arranged so that the insertion of a quarter through the coin mechanism will reset the restart in the system. This clears up temporary problems caused by power line disturbances, static, etc.

SERVICE TECHNICIAN NOTE:

The system reset circuitry described above requires that the coin counter be attached to the system. If there is a coin counter problem and no replacement is available, the game will function properly if a 10K Ohm resistor is connected across the coin counter input pins to the video logic board.

also

Never replace any components with anything other than exact replacement parts.

Never remove circuit board connections while power is on.

Do Not replace fuses with anything other than the proper value. A blown fuse indicates an overload condition within the game. Replacing the fuse with a higher value can cause severe damage to internal components if an overload occurs.

Always consult the manual before attempting repairs.

Correspondence regarding this game should be addressed to:
GREMLIN/SEGA
8401 Aero Drive
San Diego, California 92123
(714) 277-8700

installation procedures

Your new "**Space Firebird**" game is ready to play immediately upon arrival. But, we at GREMLIN/SEGA are quality-minded and feel that your inspection is the final step in the Quality Control process.

Before you plug in your game, open the rear access panel and make a final inspection of the interior of the game. Check all connectors to ensure they are firmly seated. Check the ICs to verify that they are securely plugged in or soldered in place and remove any foreign objects and loose bits of solder. Make sure all major subassemblies are plugged in properly.

INSTALLATION REQUIREMENTS

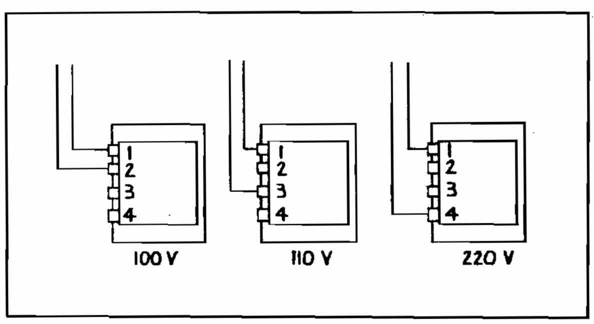
Power	100 VAC, 60 HZ (nominal), 175 watts 110VAC, 60 HZ (nominal), 175 watts 220 VAC, 60 HZ (nominal), 175 watts
Temperture	0 to 38°C (32 to 100°F)
Humidity	Not over 95% relative
Space Required	25½W x 28 in.D (64.77 cmW x 71.12 cmD.)
Height	67 in. (170.18 cm)

voltage selection

Before plugging in your game, make sure that the game voltage is correct for your location. Locate the two leads from the AC junction box to the power transformer. For 100 VAC, they should be connected to terminals 1 and 2 on the power transformer. For 110 VAC, connect 1 and 3. For 220 VAC applications, they should be connected to 1 and 4.

You will also notice on the AC junction box that there is a safety interlock switch. When the rear panel is in place the switch is depressed and the game receives power. Removing the rear panel, the switch returns to original position and the power is cut off from the game. For servicing, this switch can be pulled out and power will be restored.

POWER SUPPLY TRANSFORMER OPTIONS



ALSO, THE TV MONITOR MUST BE CONVERTED TO THE SAME VOLTAGE INPUT AS THE GAME TRANSFORMER. REFER TO THE MONITOR MANUAL IN THE GAME.

game concept

"**Space Firebird**" is a one or two player game in which players are attacked from all sides by highly maneuverable Firebirds. Players can move space ship left or right and shoot a rapid-fire laser at attacking Firebirds. A special Warp Mode allows the space ship to escape danger and fire at the flock of aliens.

FIREBIRDS

The space Firebirds are an unique set of adversaries. There are three different birds, the Emperor, Eagle and Gull, which fly together in complex looping formations, firing and attacking from all directions. The player must keep track of the laser hits because each bird has a different resistance level to hits. The fearless Emperor is destoyed by four hits, the Eagle with two hits and the soaring Gull with one hit. The Eagle also has a deadly bomb which is launched at the space ship. Extra points are scored by hitting the bomb before it explodes. The bomb when hit, scatters into deadly shrapnel. To avoid the flying shrapnel, the bomb must be hit from directly underneath.

SPACE SHIP

The space ship can be moved right or left to evade attacking Firebirds. Depressing the fire button enables the space ship to shoot its laser at approaching Firebirds. Players receive 3 (4, 5 or 6) space ship per play.

WARP MODE

Activate warp mode to escape impeding danger or to strike out at approaching birds. There is only warp mode per space ship. When activated, the space ship is launched into space with a force field around it that deflects enemy fire. In warp mode, Firebirds can be eliminated by ramming into them or by firing at close range.

SCORING

By destorying the Emperor, a player receives 100 points, the Eagle nets 50 points, the Gull—20 points and the bomb scores 50 to 200 points. Each battle consists of 50 Firebirds and 1,000 bonus points are awarded if all are destoryed. If all Firebirds are destoryed, the player moves into a new battle sequence that increases in difficulty. One new space ship is awarded for a score of 5,000 (8,000) points. Game ends when all space ships are destoryed.

options selection

Your "**Space Firebird**" game is equpped with a set of switches that allows operators a number of options. The switches are located on the game logic board.

Switch adjustments **MUST** be done with the power off. Switches are set at 3 space ships, 1 coin/1 play, and 5,000 points for an extra ship when machine is shipped.

	DIP SWITCH SETTING					
	A	B	C	D	E	F
Number of Space Ships						
3	on	on				
4	off	on				
5	on	off				
6	off	off				
Coinage						
1 coin/ play			on	on		
2 coins/1 play			off	on		
1 coin/3 plays			on	off		
1 coin/2 plays			off	off		
Score Level For Extra Space Ship						
5,000 points					on	
8,000 points					off	
Table/Up-right						
Table						on
Up-right						off

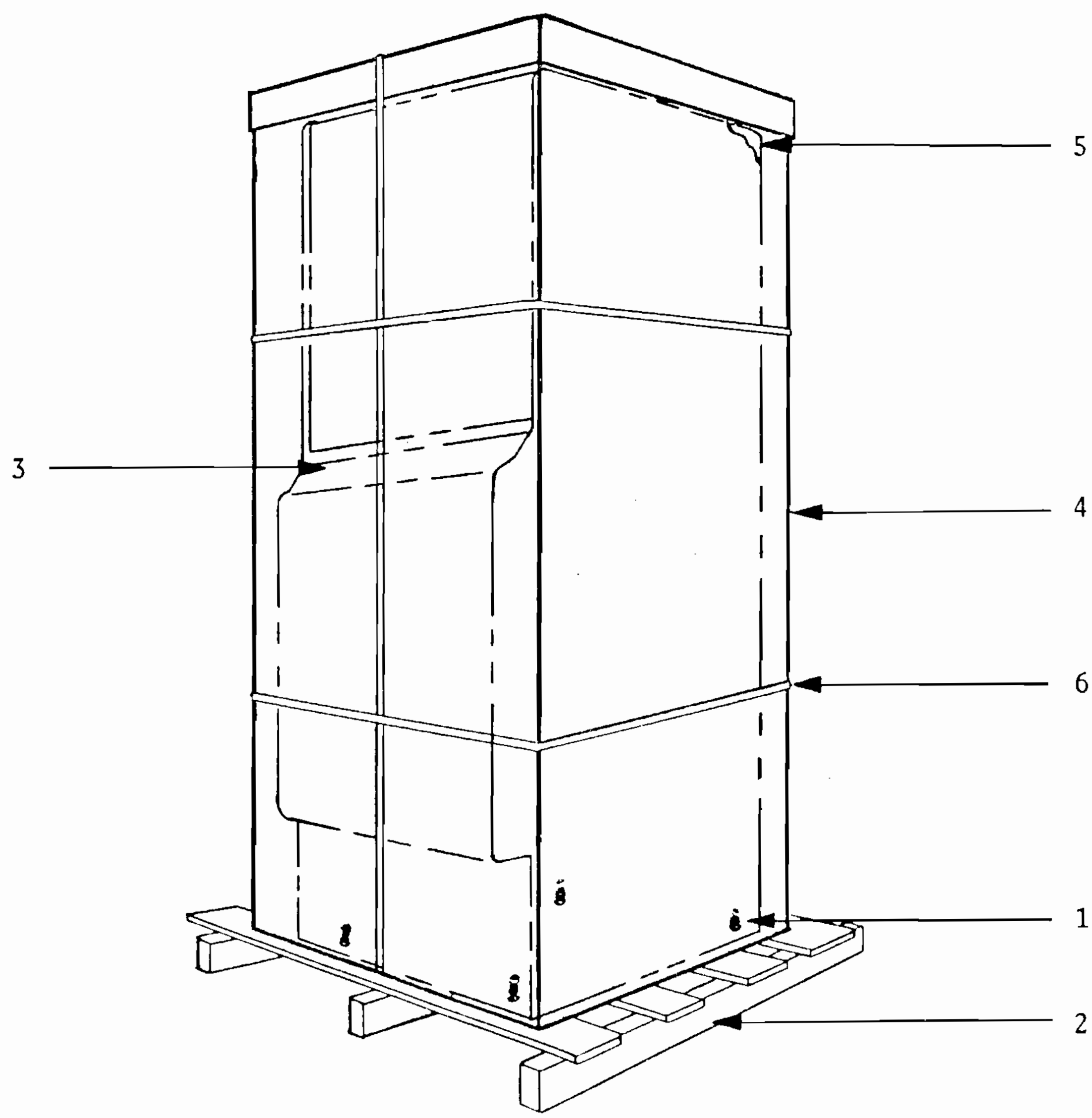
repackaging instructions

Should it be necessary to ship this game, follow the instructions below for game recrating:

A) If the original shipping bolts have been discarded (Ref. 1), obtain four 5/16-18 x 1 3/4″ hex head bolts with 5/16″ flat washers. Carefully lay the game on its side and attach skid (Ref. 2).

B) Place game upright. Tape game keys to upper flange of operator's panel (Ref. 3). Crate the game using appropriate shock-absorbent packing material (Ref. 4). Include padding on all four corners of the game. (Ref. 5). After crating is complete, secure package with strapping (Ref. 6.)

NOTE: If the game is to be shipped to GREMLIN for service or repair, attach a tag identifying the distributor and indicate the service or repair to be made; include the full serial number of the game. **GAME MUST BE SHIPPED PREPAID.**



maintenance and troubleshooting procedures

Always check and confirm the following items when it is believed that a problem has developed. These items are relatively simple but commonly overlooked.

1. Is the power switch on?
2. Are the fuses intact?
   There are three fuses (not counting the monitor fuses which are detailed in the monitor manual accompanying this game). One fuse is located on the AC junction box. The other two are on the power supply PC board. If a fuse blows out after being replaced, it indicates trouble in another component. **ALWAYS** replace with the prescribed capacity fuse, as normal equipment may be damaged if larger fuses are used as a substitute.
3. Are the connectors firmly inserted?
   Poor connector connections must be considered for any indication of trouble. Check all related connectors for poor contact. Although disconnected connectors are easily spotted, poor contacts are difficult to locate. The connectors should therefore be pushed in firmly and then loosened to spot poor connections. When testing the PC board connectors, **ALWAYS** turn off the power.
4. Turn power supply off and on again.
   As the unit may return to normal if the control circuit is reset when the game seems abnormal, turn the power off and on to see if the trouble will clear up.
5. Are there any metallic objects on the PC board?
   Ensure that there are no metallic objects on the PC board, as this will cause shorts in the system. Also refrain from putting other objects inside the cabinet.
6. Ensure that all eproms are firmly seated in the logic board.

The main logic board, video board and sound board are equipped with test points designed to simplify troubleshooting these boards. You will also find these test points listed on the game schematics.

MAIN LOGIC BOARD

TP1 The dot clock produced in the primary stage of video timing.
TP2 Z80 clock pulse.
TP3 The inverted horizonal blanking signal.
TP4 The vertical blanking signal.
TP5 The inverted sync signal.
TP6 Is HI except when the game is reset then it pulses LO.
TP7 Is LO except when the game is coined then it pulses HI.
TP8 Is always HI.
TP9 Is LO except when the game is reset then it pulses HI.
TP10 Ground.
TP11 Ground.

VIDEO BOARD

TP1 The red driver to the monitor.
TP2 The green driver to the monitor.
TP3 The blue driver to the monitor.
TP4 The vertical sync driver to the monitor.
TP5 Inverted horizonal blanking signal from logic board.
TP6 Inverted vertical blanking signal.
TP7 The "IN RENGE" signal at 2A pin 5.
TP8 The "OLIVE" signal at 2A pin 12.
TP9 DO29—pulses HI when either the computer or player fires.
TP10 The stop signal. Appears only on initial reset.
TP11 Ground.

SOUND BOARD

TP1 Blanking timing clock enabler.
TP2 Inverted vertical blanking signal.

The following instructions will help you trace down and find most problems. The procedures are listed by the more common kinds of problems that could arise. Read through all the steps first, then implement them one at a time. You will need an AC/DC voltmeter and an oscilloscope.

NO PICTURE—TV TUBE AND FLUORESCENT LAMP ARE OFF

1. Plug the game in and check to see that it is receiving 115 (230) VAC. Measure 115 VAC at the input terminals of the game transformer. If it is not present, proceed to next step.
2. Check fuse located on the bottom of the AC junction box. if it is good, proceed to next step.
3. Remove the cover of the junction box. Measure 115 VAC on the output of the EMI filter. If it is not present, the EMI filter may be bad or one of the AC line connections in the junction box may be loose. **UNPLUG** the game and re-check these connections.
4. If the fluorescent lamp still does not operate, turn the game off and then turn it on again. This usually re-starts the lamp. If it doesn't, turn the lamp in its socket. This will re-seat it for a better connection. Sometimes the lamp works loose during shipment.

NO PICTURE—TV TUBE AND FLUORESCENT LAMP ARE ON. SCREEN BLACK

1. First make a quick check of the monitor-to-logic board connections. Are all wires making contact with the pin connector? Are the wires secure on the monitor plug-in connector?
2. Check 1A, 1B, 1C, 1D, 1E, 1F, 1G, 2B, 2C, 2D, and 2E on the main logic board for proper video timing signals.

SCAMBLED PICTURE OR LOSS OF VERTICAL OR HORIZONAL HOLD

1. Check test points 1 through 5 on the main logic board.

IMPORTANT NOTE—All input from the video board to the monitor passes through a video interface board which consists of a single chip. For any monitor problems not corrected by above procedures, the video interface board may be suspect.

SOUND PROBLEM OR NO SOUND

1. Check wires running from CPU board to sound board and power supply to ensure they are intact.
2. If they are not broken then check U3 pin 3 of the power supply board. If there is no signal there, check the sound board.

INCORRECT POWER SUPPLY

1. Unplug harness from power supply to logic board. Recheck voltages. If voltages have corrected themselves, either there is a short on the logic board or the voltage regulator is breaking down under load. Replace the regulator which is associated with the faculty voltage.

GAME DOES NOT COIN UP

1. A common problem with a game that does not coin up is that the coin switch trip wire is out of adjustment. Usually, all that is necessary is to bend the trip wire up or down, depending on whether a heavier or lighter tension is needed.
2. Don't overlook the possibility of an incorrect or faulty coin switch-to-logic board connection. Sometimes these wires work loose from the coin switches.
3. Check main logic board, IC 3M, 3N, or 4N. Also check TR1.

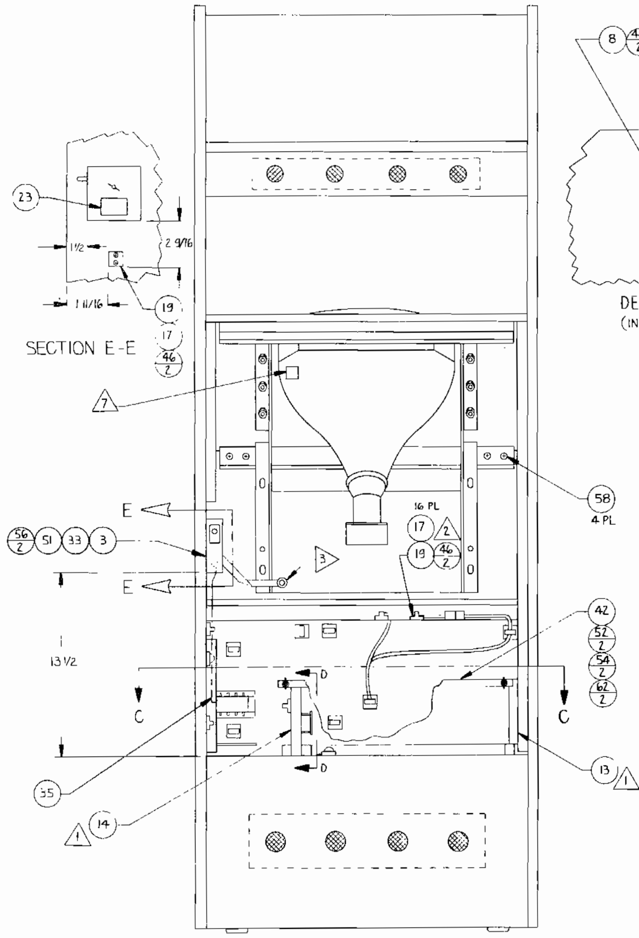
PLAYER CONTROLS NOT WORKING

1. Check first to be sure all control switch connections are secure. This includes checking the black ground wire leads.
2. If these connections are good, make sure the control panel leads are intact inside the connector to the logic board.
3. Check the main logic board, IC 1J and 1K.

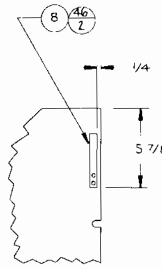
parts catalog

top assembly upright

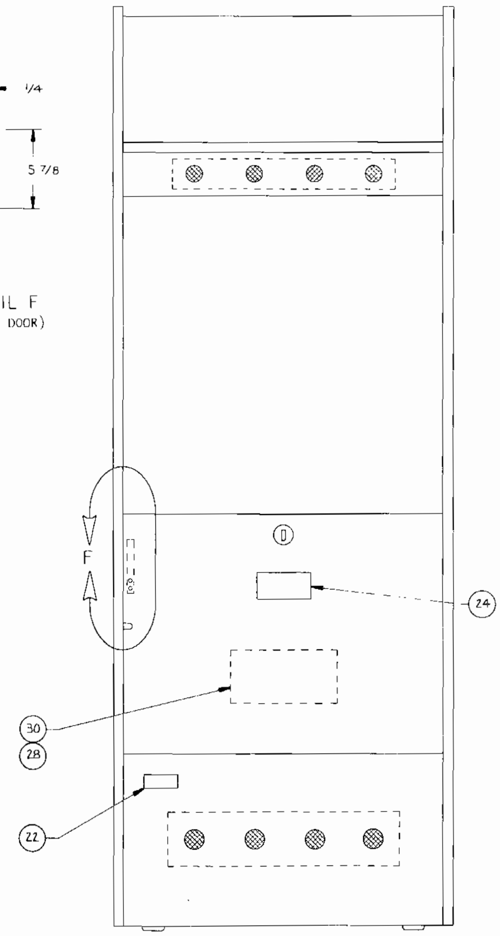
PARTS LIST			DWG NO. 700-0040
Item #	Gremlin Part #	Qty Per Assembly	Description
1	130-0001	1	SPEAKER GAME 6×9
2	130-0002	1	SPEAKER COVER
3	140-0021	1	COVER J-BOX
4	140-0049	1	CABINET DIRECT WOODGRAIN
5	250-0032	1	FR. BEZEL
6	250-0034	1	SPRING RETAINER
7	250-0038	1	MOLDING STRIP
8	250-0048	1	CLIP SWITCH
9	250-0356	2	BRKT CLR MON.
10	250-0430	1	GROUND STRAP UPR.
11	250-0435	1	RIGHT ANGLE BRKT RIGHT
12	250-0436	1	RIGHT ANGLE BRKT LEFT
13	252-0090	1	ELECTRONIC SUPPORT BLOCK RIGHT
14	252-0091	1	ELECTRONIC SUPPORT BLOCK LEFT
15	253-0104	1	PANEL MONITOR
16	253-0197	1	PANEL LOGO S/F
17	280-0005	17	CABLE TIE
18	280-0323	3	ELECTRO TAPSLICE AMP
19	280-0327	17	BASE TIE WRAP
20	320-0020	2″	SEALANT FOAM
21	390-0019	1	LAMP FLUOR 18″
22	420-0028	1	DECAL S/N
23	420-0030	1	DECAL CAUTION 115V
24	420-0040	1	DECAL RECYCLE
25	420-0041	1	DECAL S/N SMALL



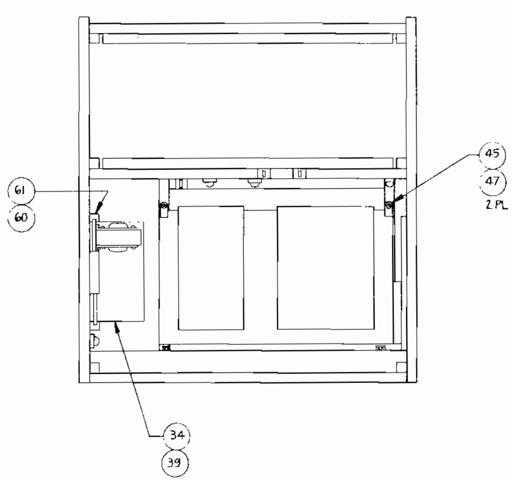
VIEW B-B
(REAR PANEL AND DOOR REMOVED)

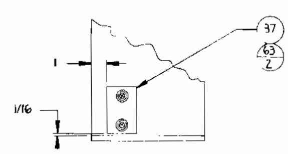


DETAIL F
(INSIDE DOOR)



VIEW B-B

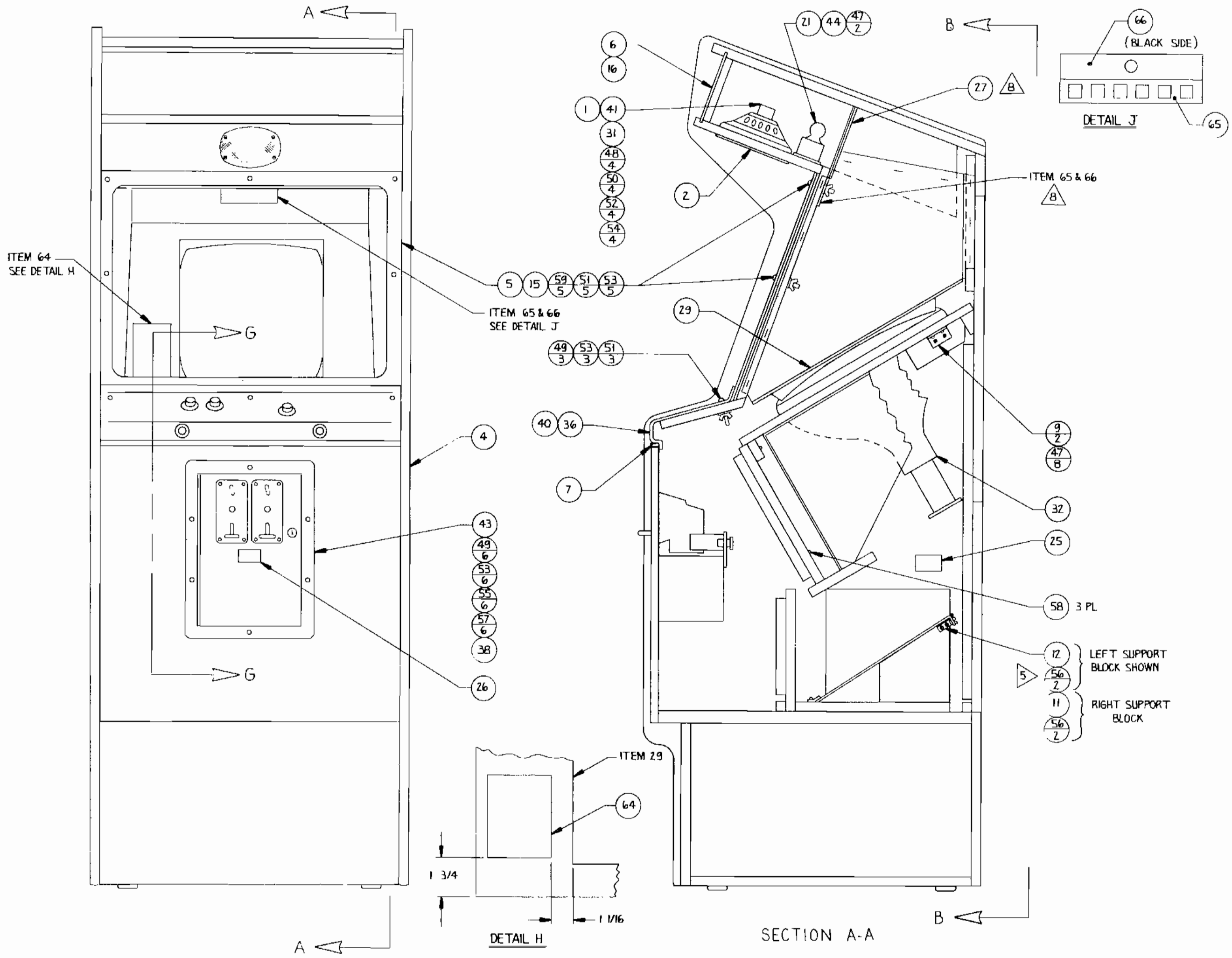


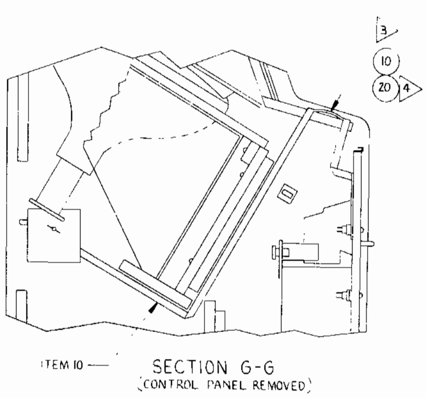


SECTION D-D

Top Assembly Upright
700-0040

Top Assembly Upright
700-0040





top assembly upright

PARTS LIST			DWG NO. 700-0040
Item #	Gremlin Part #	Qty Per Assembly	Description
26	420-0132	1	LBL PRICE 25¢
27	420-0507	1	LIGHT BAFFLE
28	420-0526	1	MANUAL ELECTROHOME (VERTICAL MT)
29	420-0532	1	GRAPHIC INTERIOR CENTER
30	420-0533	1	MANUAL S/F
31	800-0136	1	ASSY HARN SPEAKER
32	800-0140	1	ASSY MONITOR COLOR 19" VERTICAL
33	800-0145	1	ASSY AC JUNCTION BOX
34	800-0146	1	ASSY GAME PWR SUP ISO
35	800-0153	1	ASSY GROUND STRAP 18"
36	800-3120	1	ASSY CONTROL PANEL S/F
37	800-3123	1	ASSY VIDEO INTERFACE S/F
38	800-3125	1	ASSY HARN COIN MECH
39	800-3126	1	ASSY HARN POWER S/F
40	800-3127	1	ASSY HARN CONTROL PANEL
41	800-3124	1	ASSY HARN SPEAKER S/F
42	834-0042	1	ASSY GAME ELECTRONIC S/F
43	800-3131	1	ASSY COIN MECH S/F
44	800-0147	1	FLUOR LAMP ASSY 2
45	280-0324	2	CABLE CLAMP NYLON
46		36	SCR. PHL. PN. HD #6×½" SHT. MTL.
47		12	SCR. PHL. RD. HD #8×½" SHT. MTL.
48		4	SCR. MACH. SLOT HD. 8-32×1½"
49		9	BOLT CARRIAGE 10-24×1¼"
50		4	NUT HEX 8-32

top assembly upright

PARTS LIST			DWG NO. 700-0040
Item #	Gremlin Part #	Qty Per Assembly	Description
51		9	NUT, WING 10-24
52		6	WASHER FLAT #8
53		14	WASHER FLAT #10
54		6	WASHER LOCK SPLIT #8
55		6	WASHER LOCK SPLIT #10
56		6	SCR. PHL. PN.HD #8X11/14" SHT. MTL.
57		6	NUT HEX 10-24
58		6	SCR. PH. PN. HD #8×1¼" SHT. MTL.
59		5	BOLT CARRIAGE 10-24×1½"
60		1	FLAT HD. WOOD SCR #8×1"
61		REF	SUPPORT BLOCK FURNISHED WITH CAB.
62		2	NUT WING 8-32
63		2	SCR. PHL. PN. HD. #6×1" SHT. MTL.
64	420-0537	1	GRAPHIC GAME INSTRUCTIONS
65	420-0538	1	GRAPHIC WARP INSTRUCTIONS
66	420-0539	1	CARDBOARD BACKING

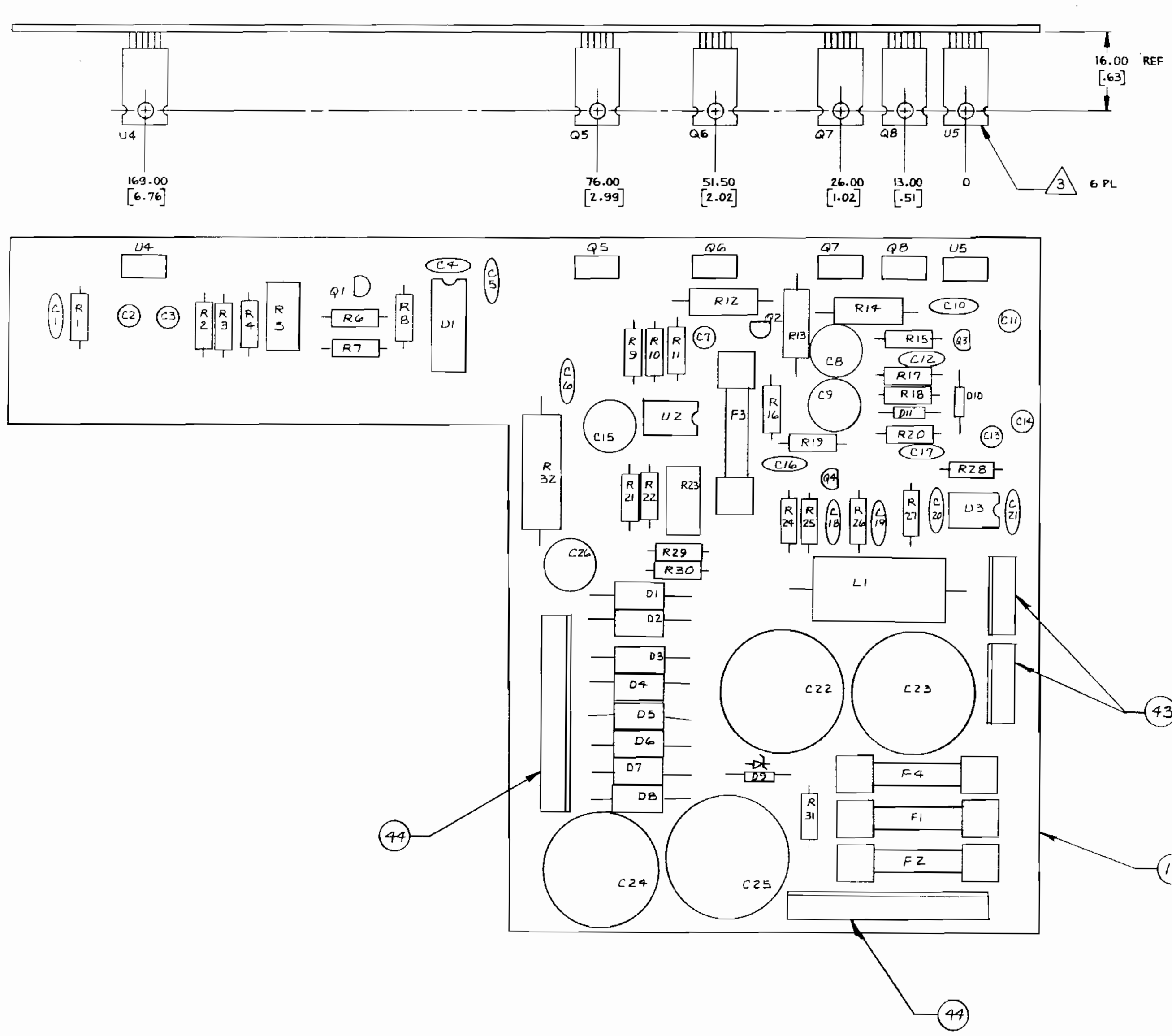
P.C. assembly game power supply

PARTS LIST			DWG NO. 800-0128
Item #	Gremlin Part #	Description	Ref Des
1	150-0088	CAPE 10 uf 25V RDL	C2, C3, C7, C11, C13, C14
2	150-0092	CAPE 100 uf 25V RDL	C8, C9, C15, C26
3	150-0095	CAPE 3300 uf 16V RDL	C24
4	150-0096	CAPE 6800 uf 16V RDL	C25
5	150-0097	CAPE 4700 uf 25V RDL	C22, C23
6	151-0001	CAP CER .05 uf 50V	C1, C6, C20, C21
7	151-0002	CAP CER 100 pf 50V	C10, C16, C17
8	151-0007	CAP CER .005 uf 100V	C5
9	151-0008	CAP CER .001 uf 50V	C12, C18
10	151-0011	CAP CER .01 uf 50V	C4
11	151-0012	CAP CER .1 uf 50V	C19
12	170-0202	PC BOARD	
13	180-0008	CHOKE 1 uH	L1
14	313-0001	IC LM 723 DIP	U1
15	313-0004	IC LM 741 EN DIP	U2, U3
16	313-0015	IC LM 320T-12	U5
17	313-0023	IC LM 320T-5	U4
18	471-0011	RES 10 OHM ½W 5%	R26
19	471-0101	RES 100 OHM ½W 5%	R2
20	471-0102	RES 1K OHM ½W 5%	R6, R7, R11, R15, R16, R21, R22
21	471-0103	RES 10K OHM ½W 5%	R8, R19
22	471-0122	RES 1.2K OHM ½W 5%	R3

P.C. assembly game power supply

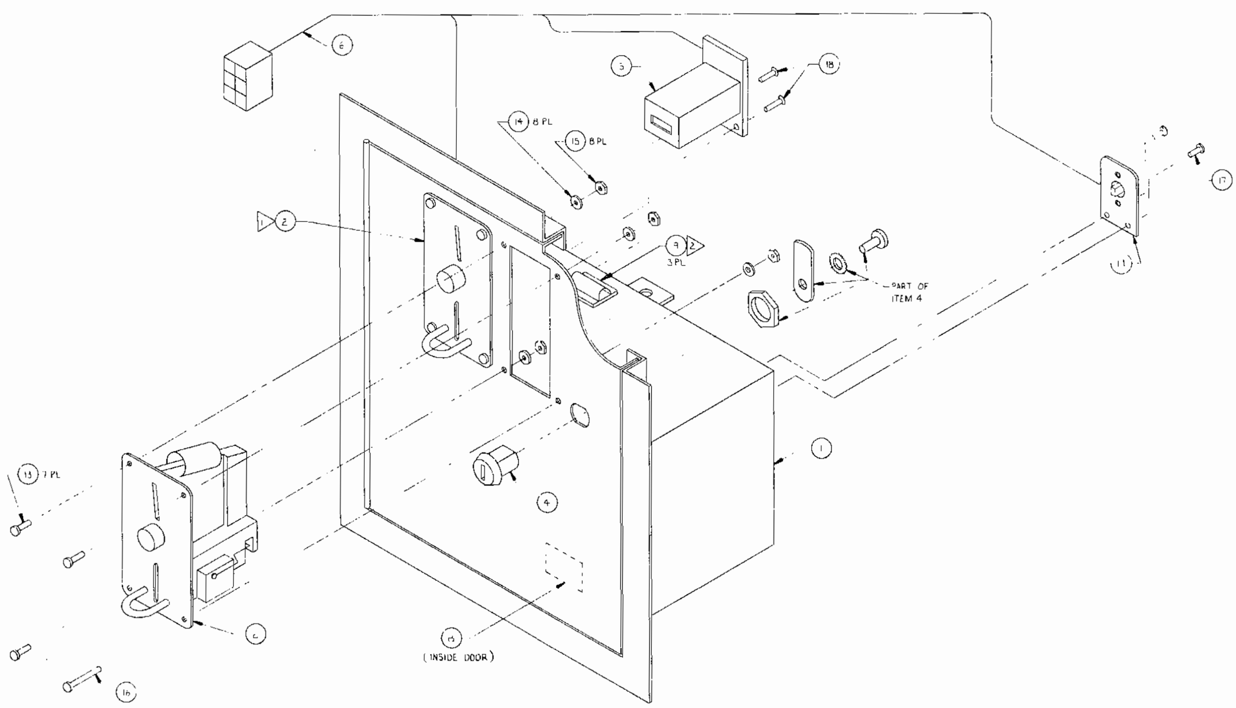
PARTS LIST			DWG NO. 800-0128
Item #	Gremlin Part #	Description	Ref Des
23	471-0221	RES 220 OHM ½W 5%	R17, R18, R24, R25
24	471-0222	RES 2.2K OHM ½W 5%	R28
25	471-0272	RES 2.7K OHM ½W 5%	R30, R31
26	471-0332	RES 3.3K OHM ½W 5%	R4
27	471-0471	RES 470 OHM ½W 5%	R9
28	471-0472	RES 4.7K OHM ½W 5%	R1, R29
29	471-0473	RES 47K OHM ½W 5%	R10, R20, R27
30	473-00R1	RES .1 OHM 5W 3%	R32
31	473-00R2	RES .2 OHM 3W 5%	R12-R14
32	475-0004	POT 1K CAR PCMTV	R5, R23
33	481-0004	DIODE MR501	D1-D8
34	481-0008	DIODE IN5231	D9
35	481-0006	DIODE IN914/IN4148	D10, D11
36	482-0006	XSTR 2N4403	Q1, Q2, Q4
37	482-0014	XSTR 2N4401	Q3
38	482-0019	XSTR TIP 120	Q5, Q7
39	482-0100	XSTR TIP 125	Q6, Q8
40	514-0002	FUSE 3A NORM	F1, F3, F4
41	514-0003	CLIP FUSE MTG	F2
42	514-0006	FUSE 1.5A NORM	
43	212-0004	CONN 4 PIN M	
44	212-0021	CONN 10 PIN M	

P.C. Assembly Game Power Supply
800-0128



assembly coin mechanism

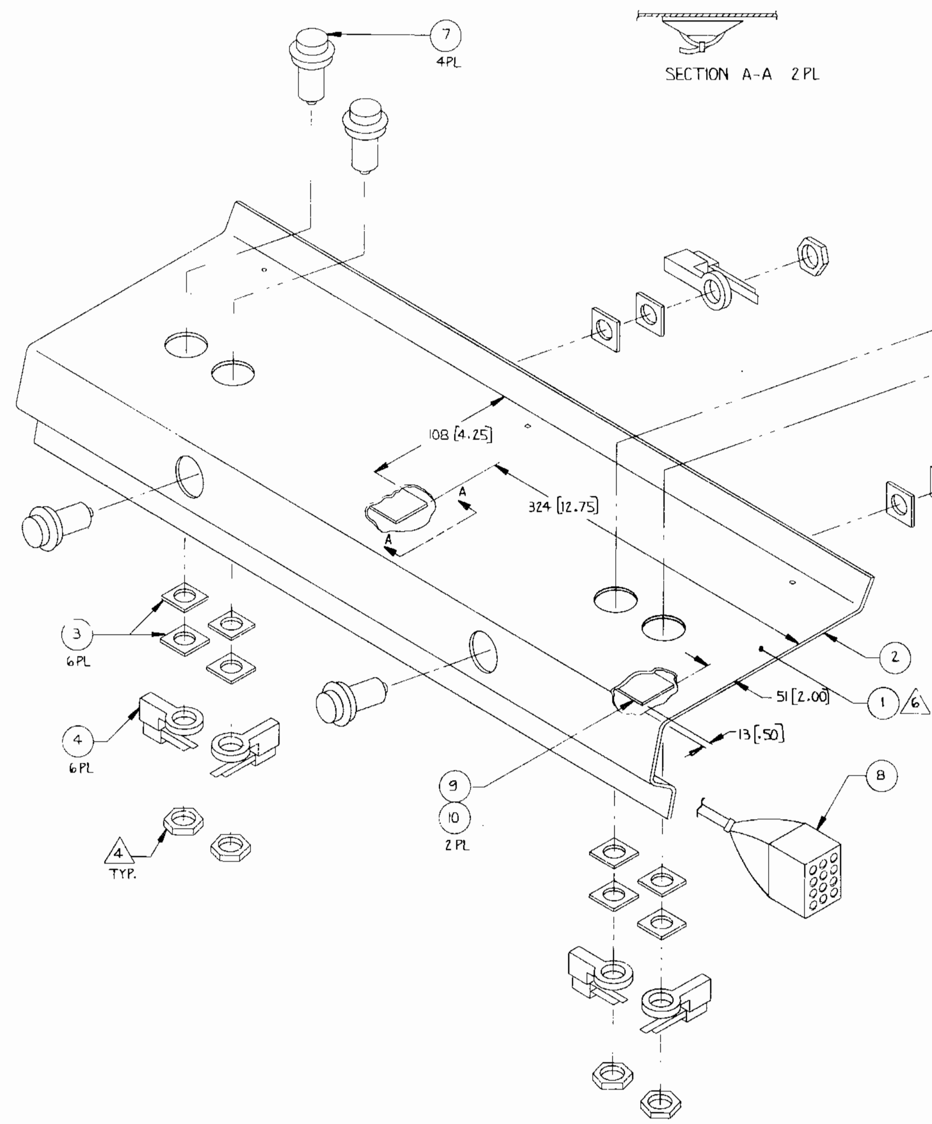
PARTS LIST			
Item #	Gremlin Part #	Qty Per Assembly	Description
1	250-0285	1	FRAME CASH DOOR, MODIFIED
2	220-0066	2	COIN MECHANISM
3	220-0008	1	COUNTER, DIGITAL
4	220-0035	1	LOCK, FORT LOCK IR
5			
6	800-3132	1	ASSY, HARN, COIN MECH INTERFACE
7			
8	420-0038	1	DECAL, IMPORTANT NOTE
9	280-0327	3	BASE TIE WRAP
10	280-0323	2	ELECTRO TAP SPLICE AMP
11	800-0152	1	ASSY SERVICE SWITCH
12	280-0005	3	CABLE TIE
13		7	SCREW #8-32×½" TAMPER-PROOF
14		8	WASHER, LOCK SPLIT #8
15		8	NUT, HEX #8-32
16		1	SCREW #8-32×1" TAMPER-PROOF
17		2	SCREW SHT METAL #6×3/8"
18		2	*SCREW SHT METAL #6×½"*
19	510-0042	2	COIN SWITCH



Assembly Coin Mechanism
800-3131

assembly control panel

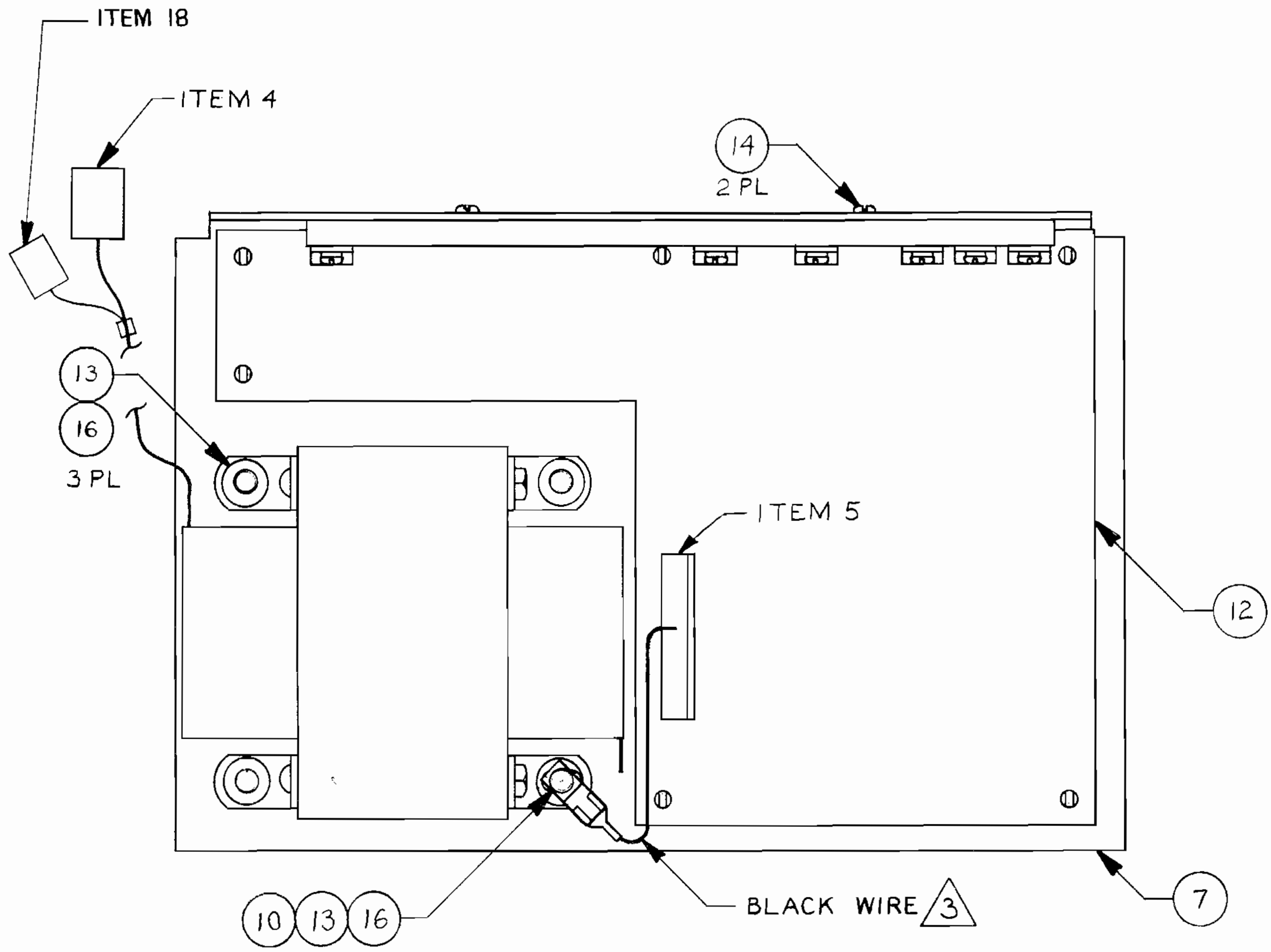
PARTS LIST			DWG NO. 800-3120
Item #	Gremlin Part #	Qty Per Assembly	Description
1	253-0196	1	GRAPHIC CONTROL PANEL
2	250-0367	1	SUB PANEL METAL S/F UP
3	253-0031	12	SPACER, WICO SWITCH
4	510-0023	6	ASSEMBLY SWITCH WICO
5	240-0111	1	BUTTON PLGR BLUE
6	240-0006	1	BUTTON PLGR RED
7	240-0009	4	BUTTON PLGR YEL
8	800-3130	1	ASSY HARN PLAYER CONTROL
9	280-0327	2	BASE TIE WRAP
10	280-0005	2	CABLE TIE

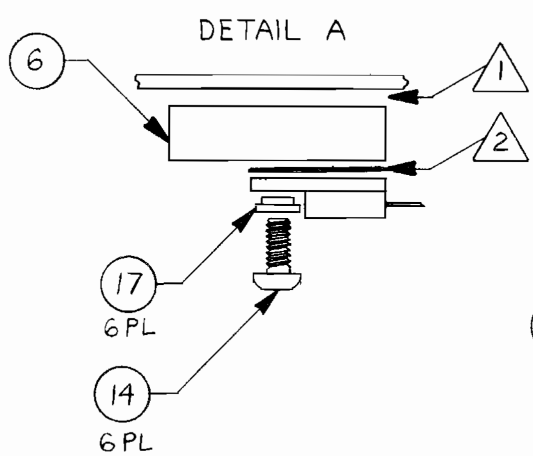


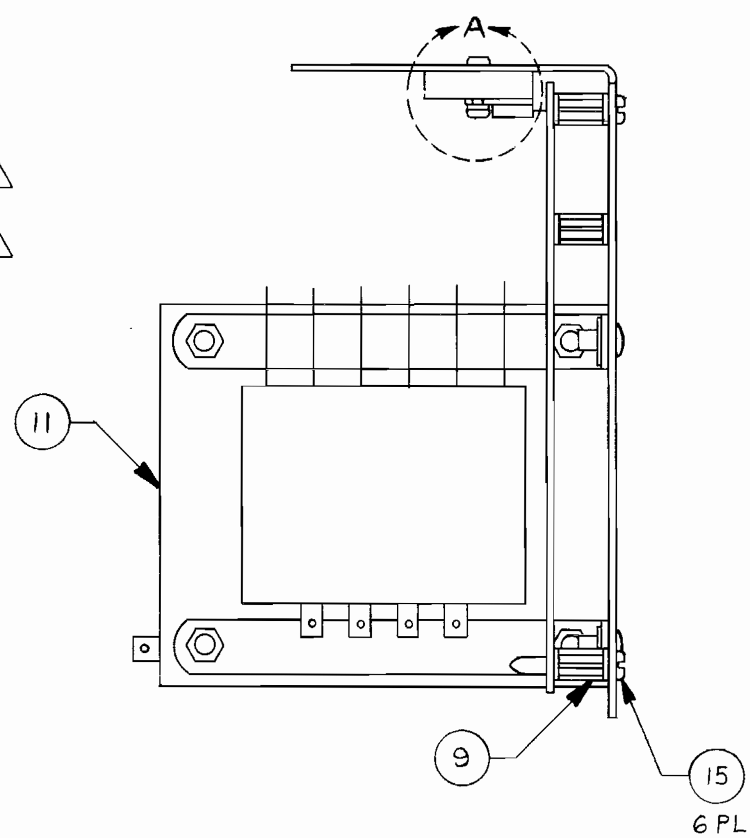
Control Panel
800-3120

assembly linear power supply

PARTS LIST			DWG NO. 800-0146
Item #	Gremlin Part #	Qty Per Assembly	Description
1	211-0005	7	CONN CRIMP LOCK
2	211-0017	1	CONN FEM QUICK ¼
3	211-0042	5	CONN SOCKET AMP
4	211-0059	1	CONN PLUG 3 PIN AMP
5	212-0016	1	CONN FEM 10 PIN
6	250-0433	1	HEAT SINK PWR SPLY ISOL
7	250-0434	1	CHASSIS PWR SPLY ISOL
8	280-0005	4	CABLE TIE
9	280-0014	6	STAND OFF CLIPS
10	280-0117	1	TAB, RIVET
11	560-0054	1	XFMR ISOL
12	800-0128	1	P.C. ASSY GM PWR SPLY
13		4	RIVET POP 3/16
14		8	SCR MACH PN HD #4-40 × ¼
15		6	SCR SHT METAL #6 × ½
16		4	WASHER FLAT #10
17		6	TRANSISTOR INSULATOR
18	211-0043	1	CONN PLUG 2 PIN AMP
19	280-0323	2	ELECTRIC TAP SPLICE
20	600-0079	6″	2 COND ZIP CORD

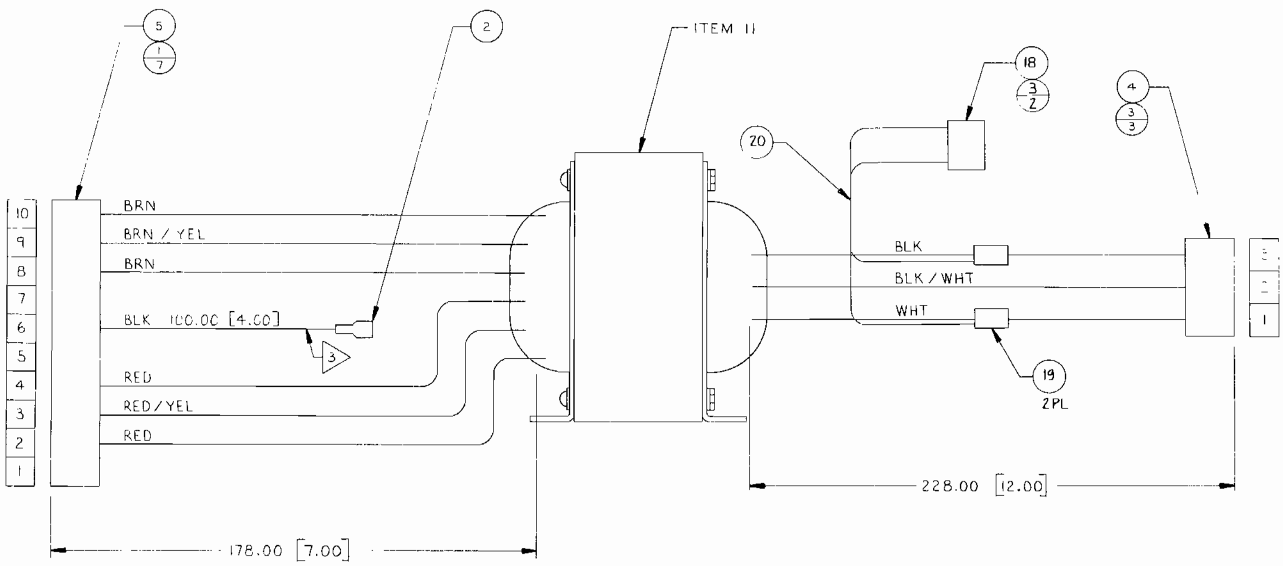






Assembly Linear Power Supply 800-0146

Assembly Linear Power Supply
800-0146

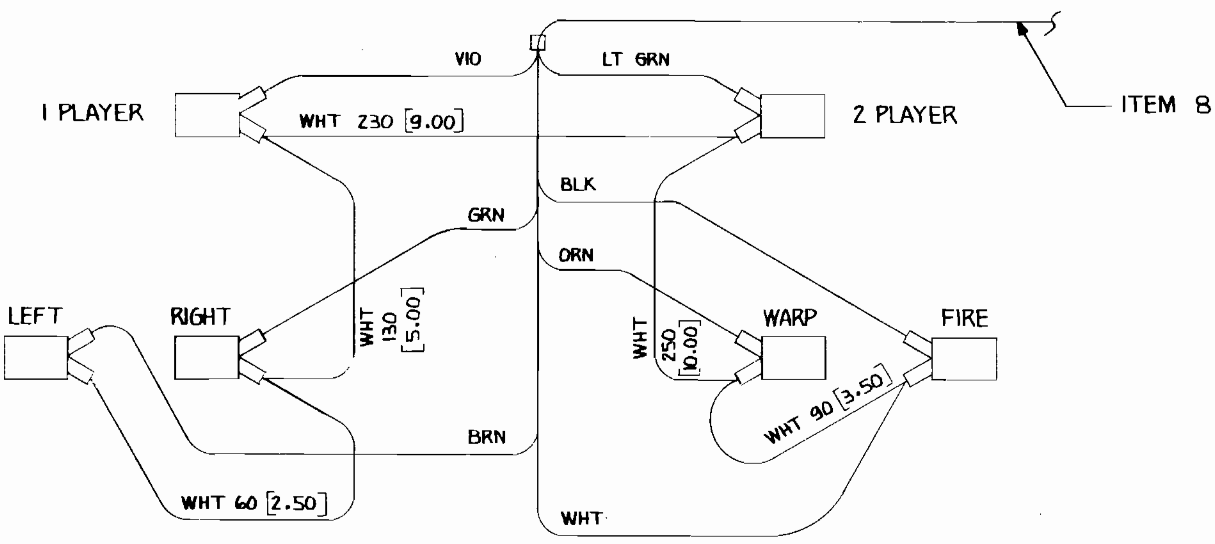


recommended spare parts

Gremlin Part #	Description	Quantities Per 10 Games
130-0001	Speaker	1
130-0002	speaker cover	2
200-0019,21/22	color monitor	1
220-0035	lock (coin door)	2
220-0066	coin mechanism	2
240-0006	red button	5
240-0009	yellow button	5
240-0111	blue button	5
250-0034	spring retainer	5
250-0285	front cash door	1
253-0104	panel monitor	1
253-0197	panel logo S/F	2
253-0196	control panel graphics S/F	1
390-0019	fluorescent lamp	1
420-0532	interior graphics S/F	1
420-0533	manual S/F	2
420-0486	manual electrohome monitor	1
510-0051	switch pushbutton slide	1
510-0023	WICO switch assembly	5
514-0001	2A fuse (AC junction box)	5
560-0054	game transformer	1
230-0013	8.00 MHZ crystal	3
834-0041	video interface board	1
514-0002	3A fuse (power supply board)	5
514-0006	1.5A fuse (power supply board)	5
230-0032	20.160 MHZ crystal	3
316-0767	TST 5E Eprom (CPU)	1
316-0768	TST 5F Eprom (CPU)	1
316-0769	TST 5H Eprom (CPU)	1
316-0770	TST 5I Eprom (CPU)	1
316-0771	TST 5J Eprom (CPU)	1
316-0772	TST 5K Eprom (CPU)	1
316-0773	TST 5M Eprom (CPU)	1
316-0774	TST 5N Eprom (CPU)	1
316-0775	TST 20 Eprom (sound)	1
316-0776	TST 5K Eprom (video)	1
316-0777	TST 6K Eprom (video)	1
313-0036	MB3712 IC (linear-sound)	3
315-0069	8020 IC (ram-video)	3
315-0071	MB7063 IC (ram-video)	3
316-0778	4I-A Prom (video)	2
316-0779	3N-A Prom video)	2

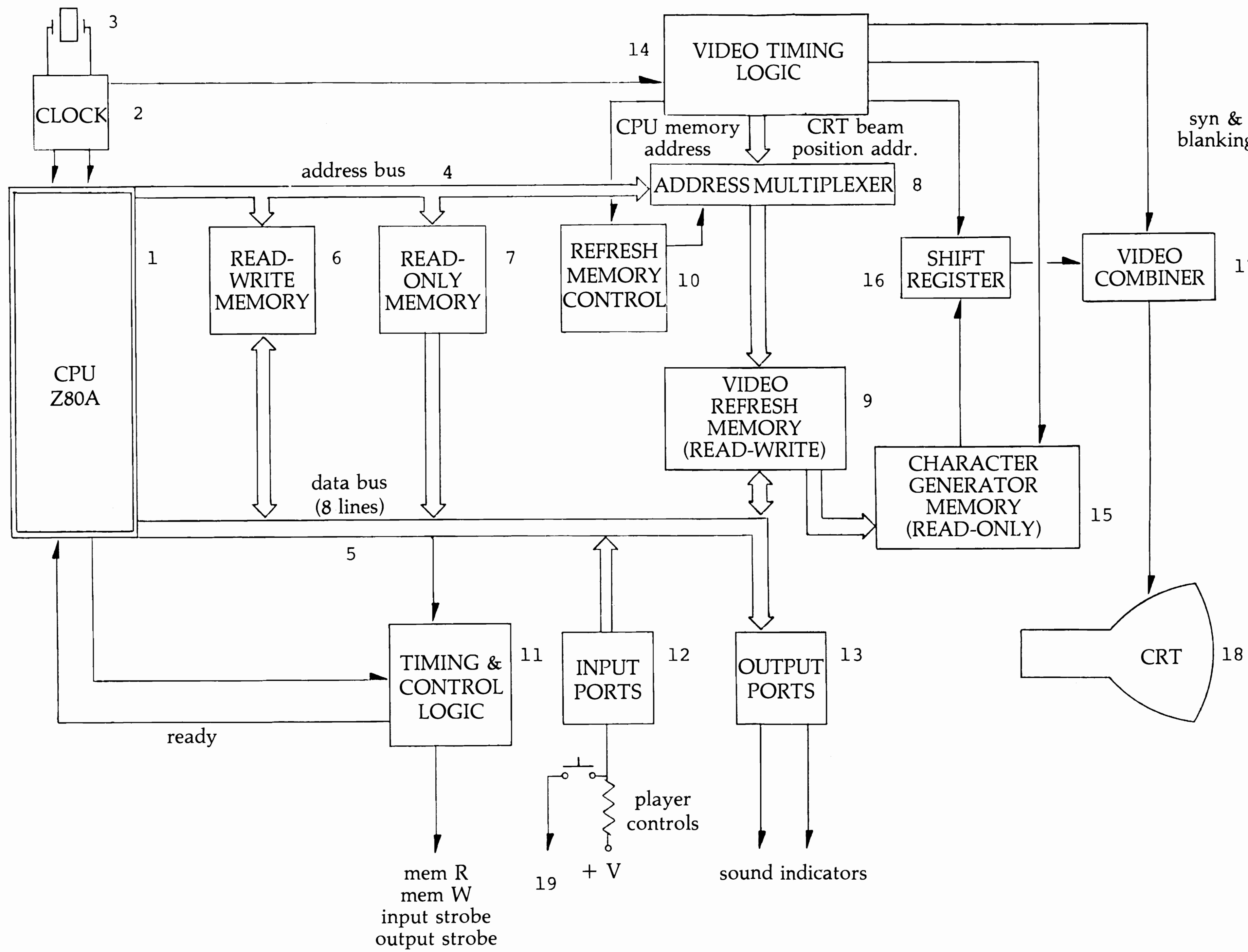
schematics

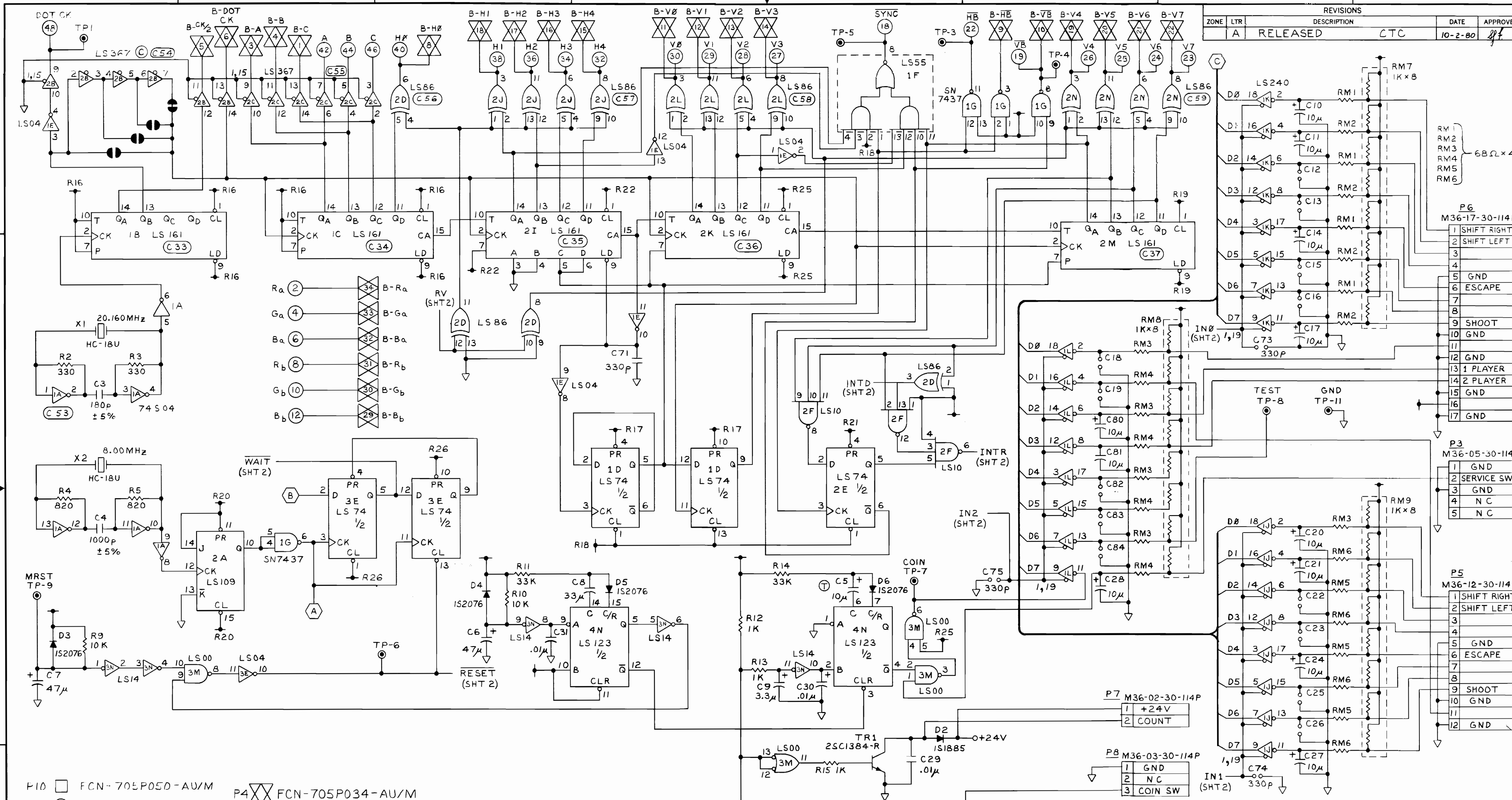
Control Panel Wiring Diagram
800-3120

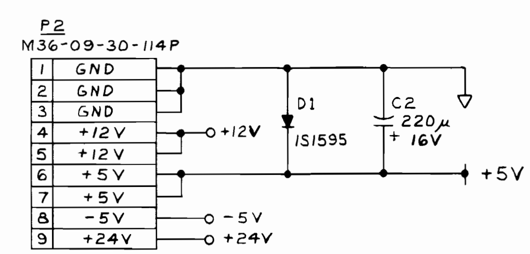


BLOCK DIAGRAM: Refer to schematics for parts that make up this diagram.

1. Logic Board 4A.
2. Logic Board 1A, 1G, and 2A.
3. Logic Board 8.00 MHZ Crystal, 20.160 MHZ Crystal.
4. Logic Board A0 through A15 on Z80, buffered by 5B, 5C, and 5D.
5. D0 through D7 on Z80, buffered by 4B and 4C.
6. Logic Board 4E, 4F, 4G, and 4H.
7. Logic Board All Eproms.
8. Logic Board 3I, 4I and 4J; Video Board 4B, 5A, and 6A.
9. Video Board 5B, 5C, 5D, 5E, 6B, 6C, 6D, 6E, 6G and 6H.
10. Video Board 4B and 5A; Logic Board 3A, 3B, 4A, 4L, and 6A.
11. Logic Board 3A, 3B, 3I, 4A, and 4L.
12. Logic Board 1J, 1K, and 1L.
13. Logic Board 1G, 2B, 2C, 2D, 2J, 2L, 2N, 3G, and 3J.
14. Logic Board 1A, 1B, 1C, 1D, 1E, 1F, 1G, 2B, 2C, 2D, 2E, 2F, 2I, 2J, 2K, 2L, 2M, and 2N.
15. Video Board 5K and 6K.
16. Video Board 3H, 4H, 4N, 5M, and 6M.
17. Video Board 1A and 3N.
18. Monitor.
19. Player controls.







ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED CTC	10-2-80	

P10 □ FCN-705P050-AU/M

P9 ○ FCN-705P050-AU/M

P4 ⊠ FCN-705P034-AU/M

⬡ - INDICATES INTER SHEET CONNECTION

6. MARKS INDICATE A CUT LAND.
5. IF BOARD NO. IS 01 EXCHANGE VALUES OF C5 AND C8.
4. ENCIRCLED "C" NUMBER INSIDE AN I.C. REPRESENTS A .068 UF BYPASS CAPACITOR FOR THE +5V LINE AT THAT POINT.
3. IC'S MARKED WITH (S) USE A SOCKET.
2. ─♦ R(XX) IS A PULL UP RESISTOR.
1. ─♦ MARK INDICATES +5V.

NOTES:

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

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APPLICATION

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CHECKED	T.J. Liskowiak	10-2-80

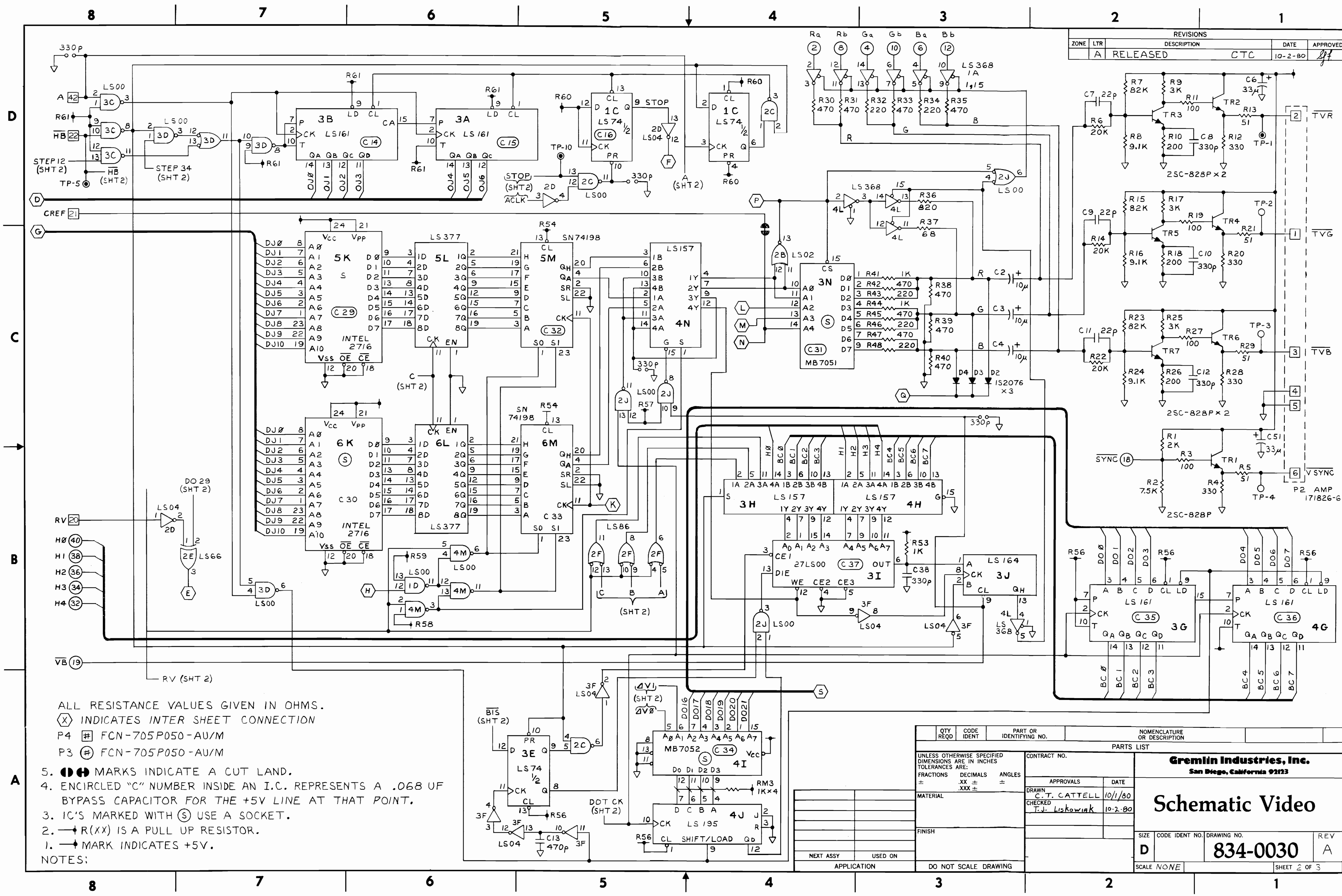
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San Diego, California 92123

Schematic CPU

SIZE D | CODE IDENT NO. | DRAWING NO. 834-0031 | REV A

SCALE NONE | SHEET 2 OF 3

834-0031 A



NOTES:

1. —♦ MARK INDICATES +5V.
2. —♦ R(XX) IS A PULL UP RESISTOR.
3. IC'S MARKED WITH (S) USE A SOCKET.
4. ENCIRCLED "C" NUMBER INSIDE AN I.C. REPRESENTS A .068 UF BYPASS CAPACITOR FOR THE +5V LINE AT THAT POINT.
5. ◐◑ MARKS INDICATE A CUT LAND.

P3 (#) FCN-705P050-AU/M

P4 [#] FCN-705P050-AU/M

(X) INDICATES INTER SHEET CONNECTION

ALL RESISTANCE VALUES GIVEN IN OHMS.

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

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MATERIAL

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Schematic Video

SIZE D | CODE IDENT NO. | DRAWING NO. 834-0030 | REV A

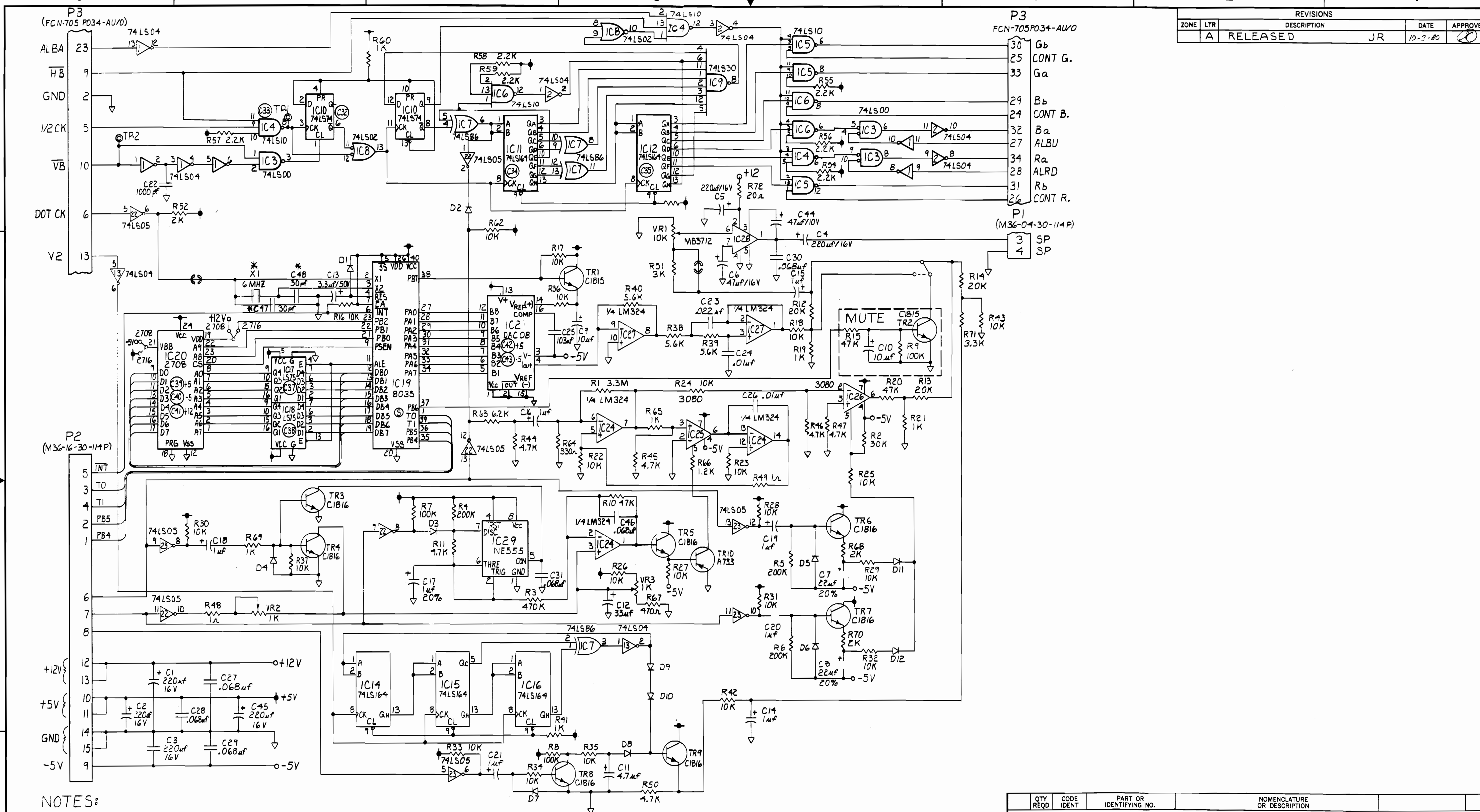
SCALE NONE | SHEET 2 OF 3

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REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED JR	10-3-80	



NOTES:

1. ●= +5V.
2. Ⓒ = BYPASS CAP .0683 uf.
3. Ⓢ = I.C. SOCKET TO BE USED.
4. ✻ = SELECTABLE PARTS NOT MOUNTED BY TST.
5. ⦅ = CUT LAND ON P.C.B.
6. C45 MUST BE LOCATED AT MOST END OF ANALOG CIRCUIT.

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

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APPLICATION	

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MATERIAL

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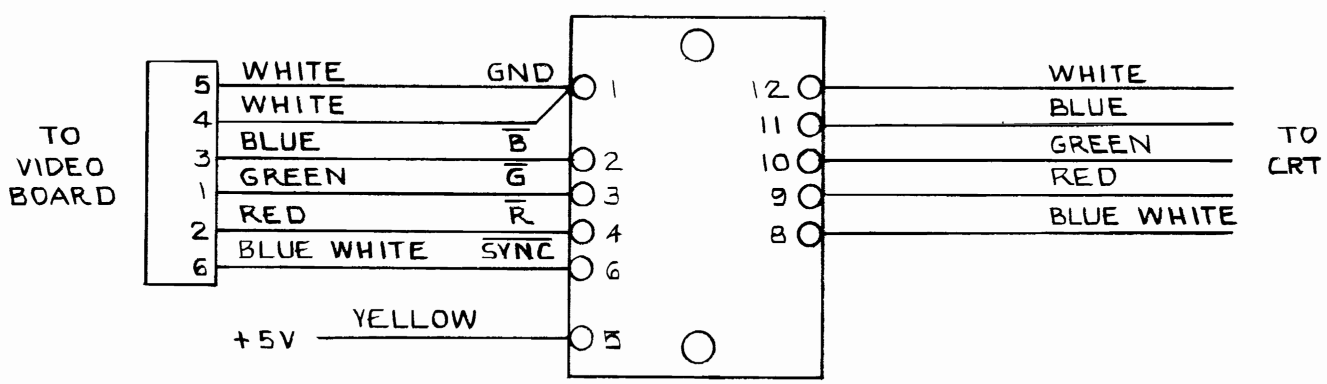
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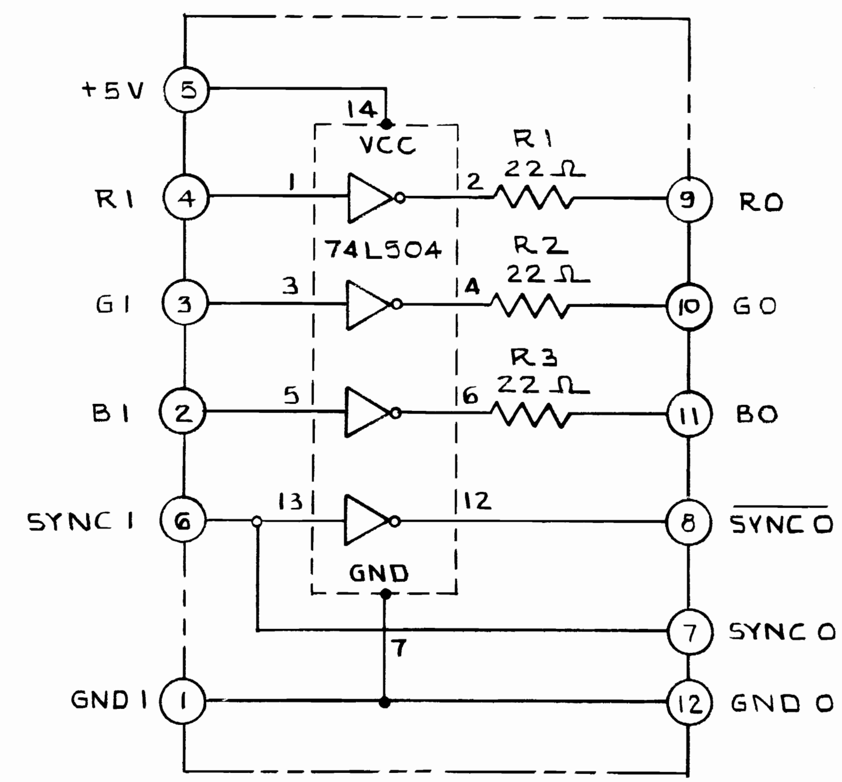
Programable Sound Board

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		834-0029	A

SCALE NONE SHEET 2 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED CJ	10-14-80	SJF





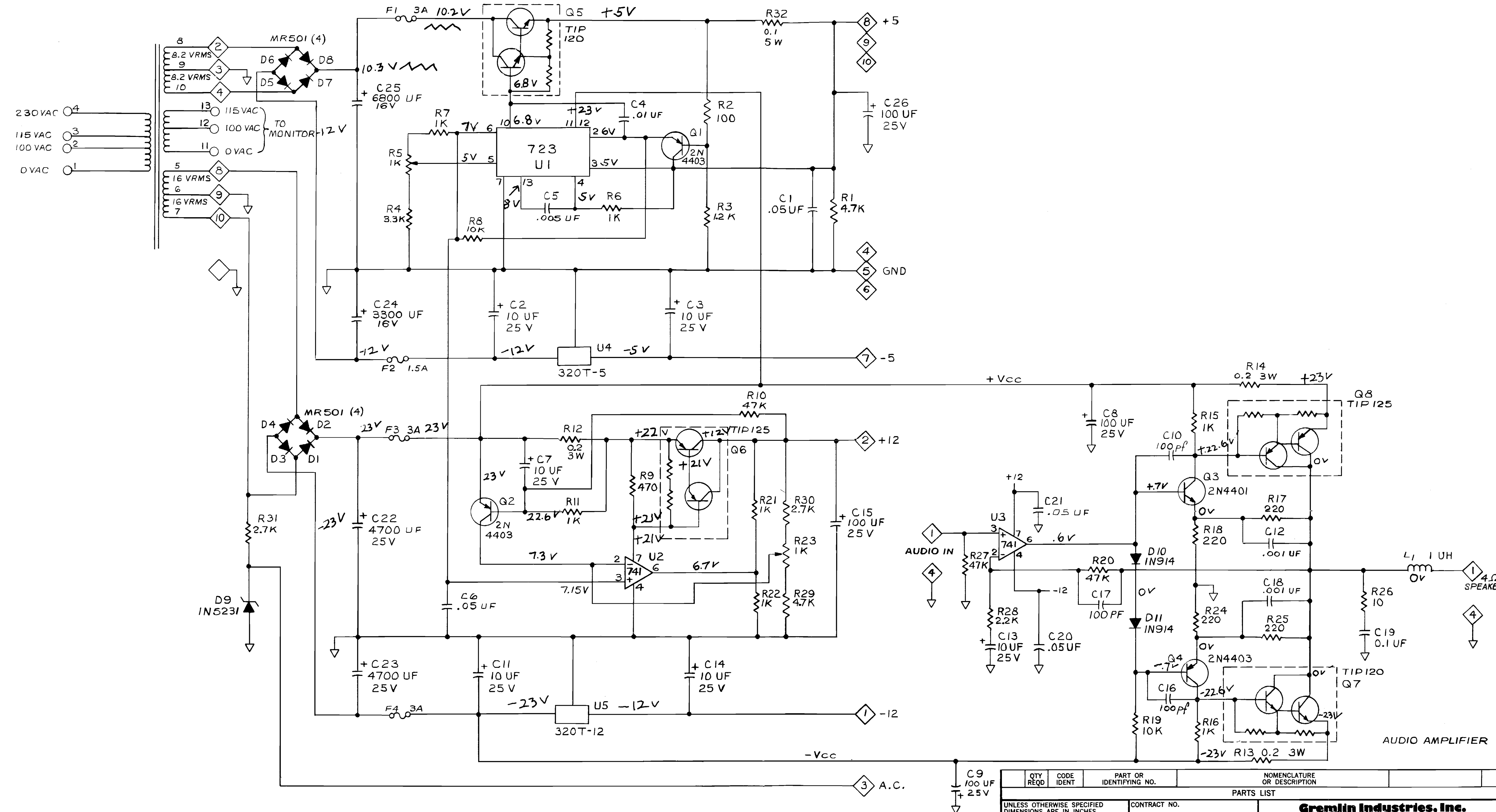
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	
		MATERIAL	APPROVALS / DATE	
			DRAWN JOHNSON 10-1-80	
		FINISH	CHECKED JEFF PEASE 10-14-80	
800-3123				
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APPLICATION		DO NOT SCALE DRAWING		

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Assembly Interface Board

SIZE	CODE IDENT NO.	DRAWING NO.	REV.
B		834-0041	A
SCALE NONE		SHEET 1 OF 1	

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	A	RELEASED CTC/LVH	9-23-80	



NOTES: UNLESS OTHERWISE INDICATED
1. ALL RESISTANCE VALUES ARE IN OHMS, 1/2 W, ±5%.

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

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MATERIAL

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800-0146	

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CHECKED	9-23-80

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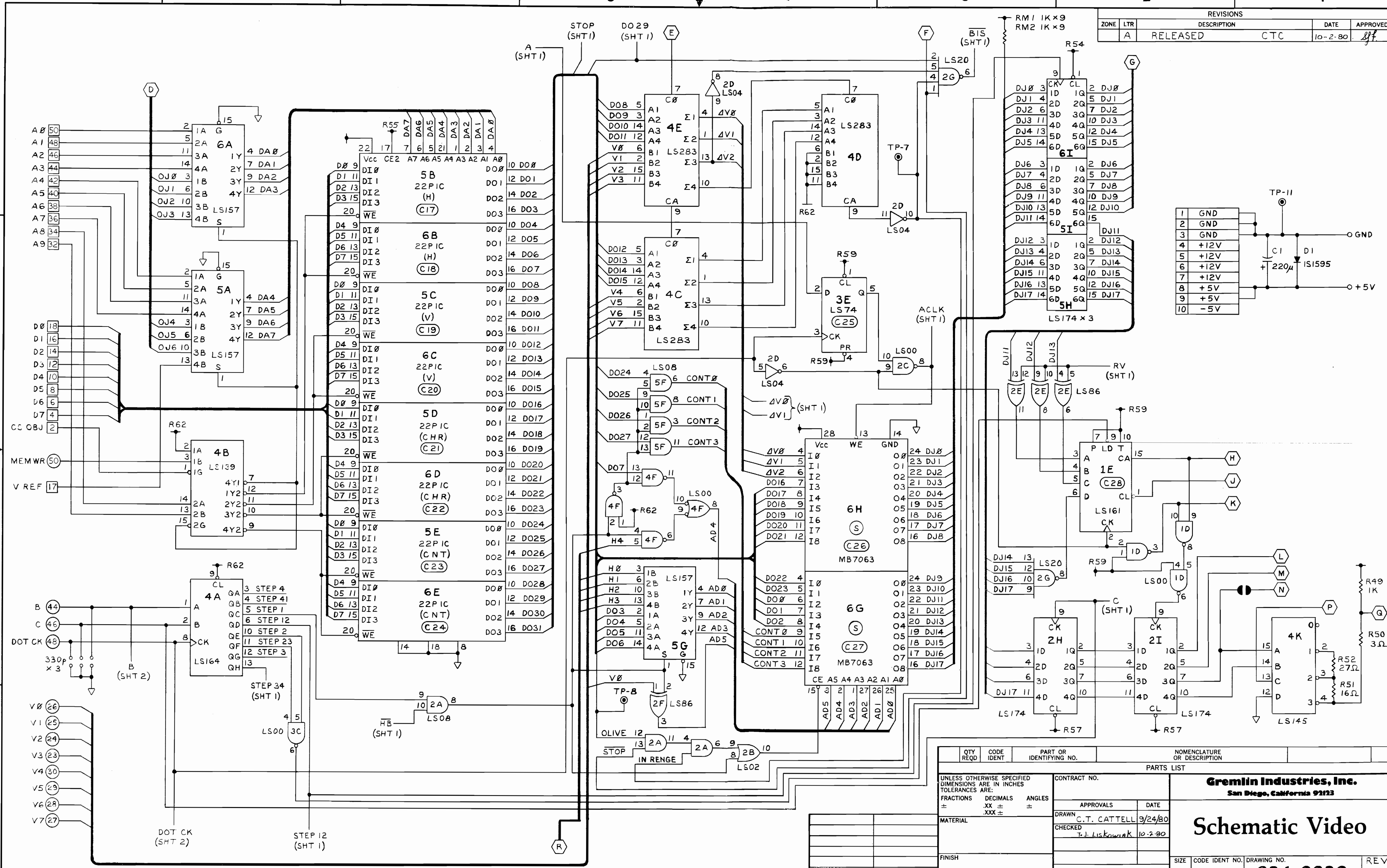
Game Power Supply

SIZE D | CODE IDENT NO. | DRAWING NO. 800-0128 | REV. A

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800-0128 A

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED CTC	10-2-80	[illegible]



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

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MATERIAL

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Schematic Video

SIZE D | CODE IDENT NO. | DRAWING NO. 834-0030 | REV A

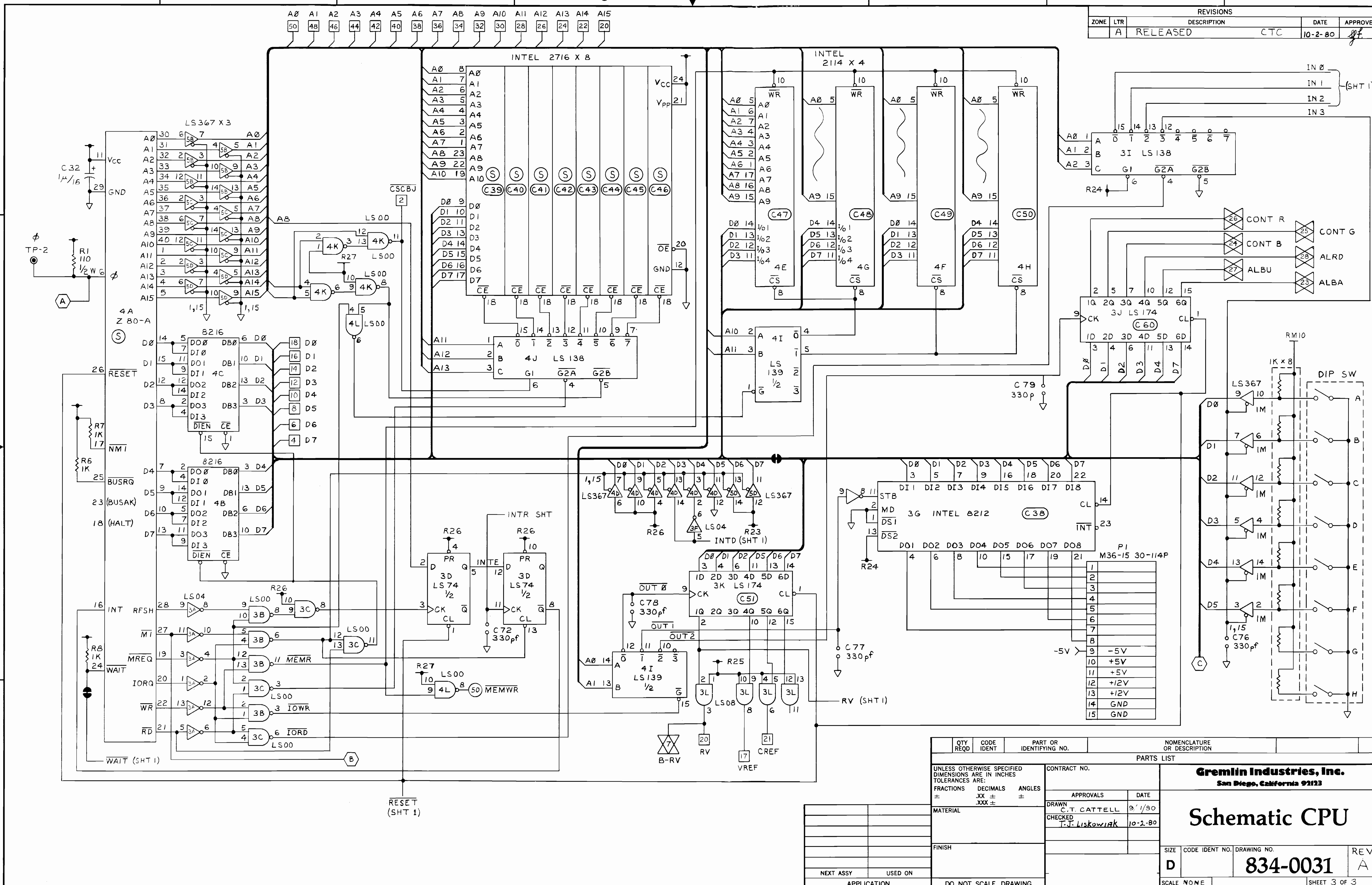
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834-0030 A



ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED CTC	10-2-80	

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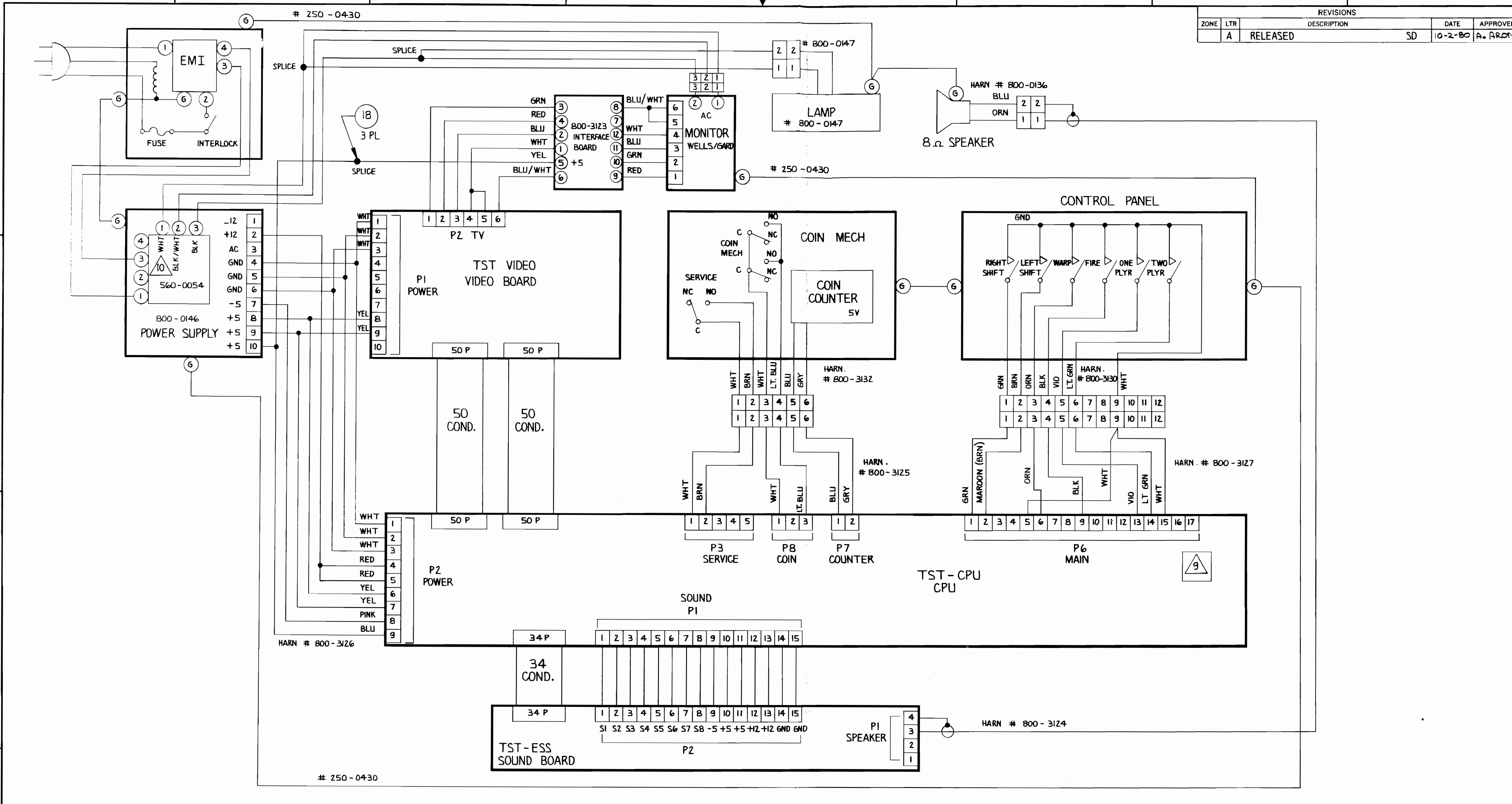
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Schematic CPU

SIZE D | CODE IDENT NO. | DRAWING NO. 834-0031 | REV A

SCALE NONE | SHEET 3 OF 3



REVISIONS					
ZONE	LTR	DESCRIPTION		DATE	APPROVED
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Top Assembly Upright

SIZE D | CODE IDENT NO. | DRAWING NO. 700-0040 | REV. A

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